

## TEST RUNS

Nominal Capacity of 9511 gpd  
Peak Capacity of 19022 gpd (Do Not Exceed)  
Save Sludge and Dewater in Press?

Parameters from NPDES Permit April 2000

See Engineering Report

Parameters Recommended in Enviroquip Proposal

Water Temperature

BOD5

TSS

Turbidity

TKN

Nitrate

Ammonia

Fecal Coliforms

Mixed Liquor TSS

Manual Cleaning with Bleach Date and Time/Procedure

Dissolved Oxygen in Membrane Tank (AIT) 4-20 mA

Blower Flow (FE1) 4-20 mA

Membrane Tank Level (LIT) 4-20 mA

Permeate Flow (Effluent Flow) (FE2) 4-20mA

Permeate Suction Pressure (PT) 4-20mA

Recycle Flow (FE3) 4-20 mA

Parameters in Engineering Report (Parametrix, Inc. February 2001)

Parameters to Check Suitability to Meet Class A Effluent

### City of Duvall MBR Pilot Plant Monitoring Schedule

Parameter	Units	Sample Point	Sample Frequency	Sample Type	Test Method	Detection Limit/Accuracy	Comment
<b>OPERATING PARAMETERS</b>							
Tank Level	feet	Membrane Tank	Continuous	4-20 mA	Ultrasonic	In report	Pilot Sensor LIT
Permeate Suction Pressure	psi	Effluent Line	Continuous	4-20 mA	Pitot	In report	Pilot Sensor PT
Pilot Plant Flow	gpm	Permeate	Continuous	4-20 mA	Flow Meter	In report	Pilot Sensor FE2
Recycle Flow	gpm	Recycle	1/day	4-20 mA	Flow Meter	In report	Pilot Sensor FE3
Blower Air Flow	cfm	Air	Continuous	4-20 mA	Pitot	In report	Pilot Sensor FE1
<b>SLUDGE PARAMETERS</b>							
MLSS	mg/l	Membrane Tank	2/Week	Grab	Std Methods	5	Sample w/DMRs
MLVSS	mg/l	Membrane Tank	2/Week	Grab	Std Methods	5	Sample w/DMRs
Settleability (30 minutes)	mL/L	Membrane Tank	1/Week	Grab	Std Methods	1	Also convert to SVI (mL/g)
Sludge Dewaterability	% solids	Membrane Tank	3 Times	Grab	Benchtop	0.1	T.E.C. Coordinate with Mfrs. Using Belt Filter Press
<b>PROCESS AND EFFLUENT PARAMETERS</b>							
Temperature	deg C	Influent	1/Day	Grab	Thermometer	0.1 deg C	Already on DMRs
	deg C	Effluent	1/Day	Grab	Thermometer	0.1 deg C	Sample w/DMRs
pH	SU	Influent	1/Day	Grab	Probe	0.1	Already on DMRs
	SU	Membrane Tank	1/Day	Grab	Probe	0.1	Sample w/DMRs
	SU	Anoxic Tank	1/Day	Grab	Probe	0.1	Sample w/DMRs
	SU	Effluent	1/Day	Grab	Probe	0.1	Sample w/DMRs
Dissolved Oxygen (DO)	mg/l	Influent	1/Day	Grab	Probe	0.1	Already on DMRs
	mg/l	Membrane Tank	Continuous	4-20 mA	Probe	0.1	Pilot Sensor AIT
	mg/l	Anoxic Tank	1/Day	Grab	Probe	0.1	Sample w/DMRs
	mg/l	Effluent	1/Day	Grab	Probe	0.1	Sample w/DMRs
CBOD	mg/l	Influent	2/Week	24-hour composite	Std Methods	0.1	Already on DMRs
	mg/l	Effluent	2/Week	24-hour composite	Std Methods	0.1	Sample w/DMRs
TSS	mg/l	Influent	2/Week	24-hour composite	Std Methods	0.1	Already on DMRs
	mg/l	Effluent	2/Week	24-hour composite	Std Methods	0.1	Sample w/DMRs
Turbidity	NTU	Effluent	3/Day	Grab	Std Methods	0.02	Enviroquip/T.E.C. to Provide

## City of Duvall MBR Pilot Plant Monitoring Schedule

Fecal Coliforms	#/100 ml	Effluent	2/Week	Grab	Std Methods	1	Compare to WWTP
Alkalinity	mg/l CaCO <sub>3</sub>	Influent	1/Week	24-hour composite	Std Methods	0.1	Sample w/DMRs
	mg/l CaCO <sub>3</sub>	Effluent	1/Week	24-hour composite	Std Methods	0.1	Sample w/DMRs
Total Ammonia	mg/l-N	Influent	2/Week	24-hour composite	Std Methods	0.1	Sample w/DMRs
	mg/l-N	Effluent	2/Week	24-hour composite	Std Methods	0.1	Sample w/DMRs
TKN	mg/l-N	Influent	2/Week	24-hour composite	Std Methods	0.1	Sample w/DMRs
	mg/l-N	Effluent	2/Week	24-hour composite	Std Methods	0.1	Sample w/DMRs
Nitrate	mg/l-N	Influent	2/Week	24-hour composite	Std Methods	0.1	Sample w/DMRs
	mg/l-N	Effluent	2/Week	24-hour composite	Std Methods	0.1	Sample w/DMRs
UV Transmittance	%	Effluent	2/Month	24-hour composite	Photometer	1	T.E.C. to Provide
Total Copper	ug/l	Influent	1/Week	24-hour composite	ICP 200.7	1	Sample with DMRs
	ug/l	Effluent	1/Week	24-hour composite	ICP 200.7	1	Sample with DMRs
Total Mercury	ug/l	Influent	1/Week	24-hour composite	ICP 245.1	0.2	Sample with DMRs
	ug/l	Effluent	1/Week	24-hour composite	ICP 245.1	0.2	Sample with DMRs
Total Silver	ug/l	Influent	1/Week	24-hour composite	ICP 200.9	0.1	Sample with DMRs
	ug/l	Effluent	1/Week	24-hour composite	ICP 200.9	0.1	Sample with DMRs
Total Zinc	ug/l	Influent	1/Week	24-hour composite	ICP 200.7	1	Sample with DMRs
	ug/l	Effluent	1/Week	24-hour composite	ICP 200.7	1	Sample with DMRs
Manual Cleaning Interval with Bleach, Record Date and Time and Procedures Used							As Needed
<b>TEST RUNS</b> Test Run No. 1 - Nominal Capacity of 9511 gpd - 3 months continuous Test Run No. 2 - Peak Capacity of 19022 gpd (Do Not Exceed) Test Run No. 3 - Peak Capacity of 19022 gpd (Do Not Exceed) separated by at least a week from Test Run No. 2 Test Run No. 4 - Peak Capacity of 19022 gpd (Do Not Exceed) separated by at least a week from Test Run No. 3							

### COMMENTS

Recycle Flow should be measured each time it is changed  
 Permeate Suction Pressure should only be measured when permeate pumps are on (i.e. during peak capacity runs)  
 Anoxic Tank level should be determined relative to membrane tank level  
 All measurements should commence when MLSS > 15,000 mg/l